



EMI TEST REPORT

Test Report No. : 25KE0251-YK-1

Applicant : Alps Electric Co., Ltd.

Type of Equipment : Bluetooth Transceiver Module

Model No. : UGPZ6

FCC ID : CWTUGPZ6

Test Item and Standard : Conducted Emissions
Out of Band Emissions (Radiated)
FCC Part15 Subpart C,
Section 15.207, Section 15.247: 2005

Test Result : Complied

1. This test report shall not be reproduced except in full, without the written approval of UL Apex Co., Ltd.
2. The results in this report apply only to the sample tested.
3. This equipment is in compliance with above regulation. We hereby certify that the data contain a true representation of the EMC profile.
4. The test results in this test report are traceable to the national or international standards.

Date of test: July 1, 2005

Tested by: M. Hosaka
Makoto Hosaka

Approved by: O. Watatani
Osamu Watatani
Site Manager of Yamakita EMC Lab.

UL Apex Co., Ltd.

YAMAKITA EMC LAB.

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MF060b(01.06.05)

Table of Contents	Page
1 Applicant Information	3
2 Product Description	4
3 Test Specification, Procedures and Results	5
4 System Test Configuration	8
5 Conducted Emissions	10
6 Out of Band Emissions (Radiated)	11
 <u>Contents of Appendixes</u>	 12
APPENDIX 1: Photographs of test setup	13
APPENDIX 2: Test Data	17
APPENDIX 3: Test instruments	31

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1 Applicant Information

Company Name : Alps Electric Co., Ltd.
Brand Name : ALPS
Address : 1-7, Yukigaya, Otsuka-cho, Ota-ku, Tokyo, 145-8501 JAPAN
Telephone Number : +81 244 35 1207
Facsimile Number : +81 244 35 1602
Contact Person : Masaaki Ueki

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2 Product Description

Type of Equipment : Bluetooth Transceiver Module
Model No. : UGPZ6
Serial No. : 1
Rating : DC 3.3V
Country of Manufacture : Japan
Receipt Date of Sample : May 13 and June 27, 2005
Condition of EUT : Production prototype
(Not for Sale: This sample is equivalent to mass-produced items.)

Model: UGPZ6 (referred to as the EUT in this report) is a Bluetooth Transceiver Module.

The clock frequency used in EUT: 26MHz

Equipment type : Transceiver
Frequency of operation : 2402 - 2480 MHz
Band width : 79 MHz
Channel spacing : 1 MHz
Channel number : 79 channels
Type of modulation : FHSS
Antenna model : HFS05-SO02NN
Antenna type : $\lambda/4$ monopole antenna
Antenna connector type : U. FL (Hirose)
Antenna gain : 1.5 dBi
Emission Designation : F1D, G1D
Operation temperature range: 15 - 35 deg. C.

FCC Part15.31 (e)

Host devise (ex. PC) provides the Bluetooth Transceiver Module with stable power supply (DC1.8V), and the power is not changed when voltage of the device is varied. Therefore, the equipment complies power supply regulation.

FCC Part15.203 Antenna requirement

Bluetooth Transceiver Module complies with the requirement. When it is put up for sale, one of the antennas is attached and the antenna is with a unique coupling to the intentional radiator.

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3 Test Specification, Procedures and Results

3.1 Test specification

Test specification : FCC Part15 Subpart C: 2005
Title : FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators
Section 15.207 Conducted limits: 2005
Section 15.247 Operation within the bands 902-928MHz, 2400-2483.5MHz,
and 5725-5850MHz: 2005

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3.2 Procedures & Results

Item	Test Procedure	Specification	Remarks	Deviation	Worst Margin	Results
Conducted emission	ANSI C63.4:2003 7. AC powerline conducted emission measurements	Section 15.207	-	N/A	21.2dB (0.2425MHz, L1, QP)	Complied
Carrier Frequency Separation	ANSI C63.4:2003 13. Measurement of intentional radiators	Section 15.247 (a)(1)	Conducted	Excluded *1	-	N/A
20dB Bandwidth	ANSI C63.4:2003 13. Measurement of intentional radiators	Section 15.247 (a)(1)	Conducted	Excluded *1		N/A
Number of Hopping Frequency	ANSI C63.4:2003 13. Measurement of intentional radiators	Section 15.247 (a)(1)(iii)	Conducted	Excluded *1		N/A
Dwell time	ANSI C63.4:2003 13. Measurement of intentional radiators	Section 15.247 (a)(1)(iii)	Conducted	Excluded *1		N/A
Maximum Peak Output Power	ANSI C63.4:2003 13. Measurement of intentional radiators	Section 15.247 (b)(1)	Conducted	Excluded *1		N/A
Spurious Emission & Band Edge Compliance	ANSI C63.4:2003 13. Measurement of intentional radiators	Section 15.247(d)	Conducted	Excluded *1	-	N/A
Spurious Emission & Band Edge Compliance	ANSI C63.4:2003 13. Measurement of intentional radiators	Section 15.247(d)	Radiated	N/A		1.8dB (14880MHz, AV, Vertical, Tx 2480MHz) Complied

The measurements also referred to FCC Public Notice DA 00-705 "Guidance on Measurement for Frequency Hopping Spread Spectrum Systems".

*1 Results for these test items are described in the test report 25JE0028-YK-1. The Module has been certificated with other type antennas.

*2 These tests were performed without any deviations from test procedure except for additions or exclusions.

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3.3 Uncertainty

Conducted emission

The measurement uncertainty (with 95% confidence level) for this test is $\pm 1.3\text{dB}$.

The data listed in this test report has enough margin, more than site margin.

Radiated emission

The measurement uncertainty (with 95% confidence level) for this test using Biconical antenna is $\pm 4.8\text{dB}$.

The measurement uncertainty (with 95% confidence level) for this test using Logperiodic antenna is $\pm 5.2\text{dB}$.

The measurement uncertainty (with 95% confidence level) for this test using Horn antenna is $\pm 6.6\text{dB}$.

The data listed in this report meets the limits unless the uncertainty is taken into consideration.

3.4 Test Location

UL Apex Co., Ltd. Yamakita EMC Lab.

907, Kawanishi, Yamakita-machi, Ashigarakami-gun, Kanagawa-ken 258-0124 JAPAN

Telephone number : +81 465 77 1011

Facsimile number : +81 465 77 2112

NVLAP Lab. code : 200441-0

No. 1 test site has been fully described in a report submitted to FCC office, and accepted on September 20, 2002 (Registration No.: 95486).

IC Registration No. : IC3489A

No. 2 test site has been fully described in a report submitted to FCC office, and accepted on April 4, 2005 (Registration No.: 466226).

IC Registration No. : IC3489A-2

No. 1 anechoic chamber has been fully described in a report submitted to FCC office, and accepted on November 8, 2002 (Registration No.: 95967).

IC Registration No. : IC3489A-B

Test room	Width x Depth x Height (m)	Test room	Width x Depth x Height (m)
No.1 shielded room	8.0 x 5.0 x 2.5	No.1 EMS lab. (Semi-anechoic chamber)	10.0 x 7.5 x 5.7
No.2 shielded room	5.0 x 4.0 x 2.5		
No.3 shielded room	4.0 x 5.0 x 2.7		

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4 System Test Configuration

4.1 Justification

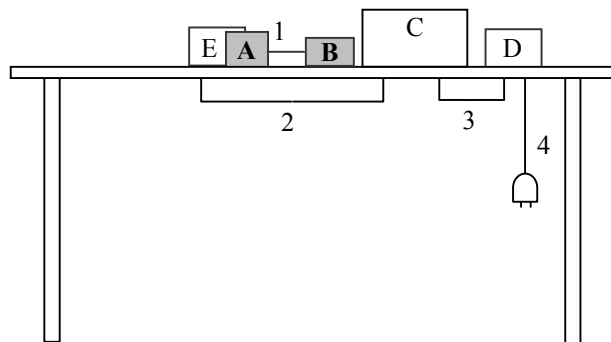
The system was configured in typical fashion (as a customer would normally use it) for testing.

Test mode: Transmitting mode (Packet size: DH5)

- Low channel : 2402MHz
- Middle channel : 2441MHz
- High channel : 2480MHz

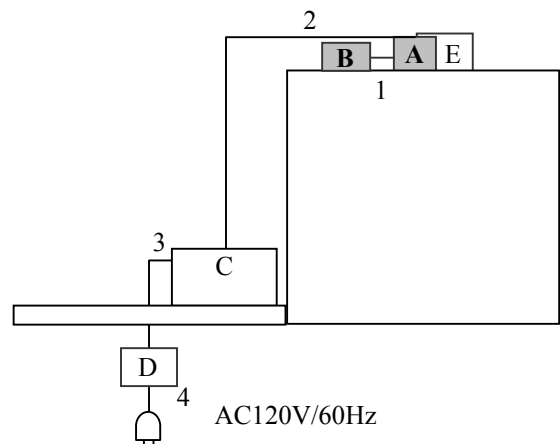
4.2 Configuration of Tested System

Front View (Conducted emission)



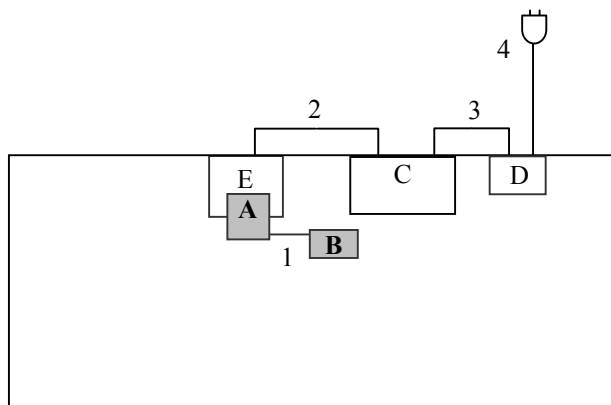
AC120V/60Hz

Front View (Radiated emission)

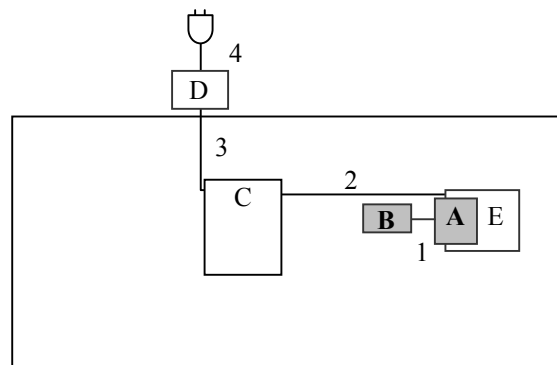


AC120V/60Hz

Top View (Conducted emission)



Top View (Radiated emission)



* Test data was taken under worse case conditions.

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Description of EUT and support equipment

No.	Item	Model number	Serial number	Manufacturer	FCC ID (Remarks)
A	Bluetooth Transceiver Module	UGPZ6	1	ALPS	CWTUGPZ6 (EUT)
B	$\lambda/4$ Monopole Antenna	HFS05-SO02NN	-	Hitachi Cable, Ltd.	(EUT)
C	Notebook PC	PA1262S9	78013342	TOSHIBA	-
D	AC Adapter	PA3048U-1ACA	0009A0222707P	TOSHIBA	-
E	Testing Board	-	-	-	(Test jig)

List of cables used

No.	Name	Length (m)	Shield	Backshell material	Remark
1	Antenna cable	0.03	Unshielded	Polyvinyl chloride	-
2	USB cable	1.9	Shielded	Polyvinyl chloride	-
3	DC cable	1.8	Unshielded	Polyvinyl chloride	-
4	AC cable	1.0	Unshielded	Polyvinyl chloride	-

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5 Conducted Emissions

5.1 Operating environment

The test was carried out in No.1 shielded room.

5.2 Test configuration

EUT was placed on a platform of nominal size, 1m by 1.8m, raised 80cm above the conducting ground plane. The rear of tabletop was located 40cm to the vertical conducting plane. The rear of peripherals was aligned and flushed with rear of tabletop. All other surfaces of tabletop were at least 80cm from any other grounded conducting surface. EUT was located 80cm from a Line Impedance Stabilization Network (LISN) and excess AC cable was bundled in center. I/O cable were connected to the peripherals were bundled in center. They were folded back and forth forming a bundle 30cm to 40cm long and were hanged at a 40cm height to the ground plane.

5.3 Test conditions

Frequency range : 0.15 - 30MHz
EUT operation mode : Transmitting

5.4 Test procedure

The EUT was connected to a LISN.

An overview sweep with peak detection has been performed.

The Conducted emission measurements were made with the following detector function of the test receiver.

Detector: QP/AV
IF Bandwidth: 9kHz

5.5 Results

Summary of the test results : Pass
Test data : APPENDIX 2 Page 17 - 21

Date : July 1, 2005 Test engineer : Makoto Hosaka

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6 Out of Band Emissions (Radiated)

6.1 Operating environment

The test was carried out in an open site.

6.2 Test configuration

EUT was placed on a platform of nominal size, 0.5m by 0.5m, raised 80cm above the conducting ground plane. A drawing of the set up is shown in the photos of Appendix 1.

6.3 Test conditions

Frequency range : 30MHz - 26GHz
Test distance : 3m
EUT operation mode : Transmitting

6.4 Test procedure

The Radiated Electric Field Strength intensity has been measured with a ground plane and at a distance of 3m. The measuring antenna height was varied between 1 and 4m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity. The measurements were performed for both vertical and horizontal antenna polarization.

In any 100kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator confirmed 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on a radiated measurement.

Measurements were performed with QP, PK, and AV detector.

The radiated emission measurements were made with the following detector function of the test receiver.

When using Spectrum analyzer, the test was made with adjusting span to zero by using peak hold.

Frequency	Below 1GHz	Above 1GHz
Instrument used	Test Receiver	Spectrum Analyzer
Detector	QP: BW 120kHz	PK: RBW: 1MHz/VBW: 1MHz
IF Bandwidth		AV: RBW: 1MHz/VBW: 10Hz

The equipment was previously checked at each position of three axes X, Y and Z. The position in which the maximum noise occurred was chosen to put into measurement. See the table below and photographs in page 15 to 16. With the position, the noise levels of all the frequencies were measured.

Combinations of the worst case

	Module	Antenna
Below 1GHz		
Horizontal	Z	Z
Vertical	X	Z
Above 1GHz		
Horizontal	X	X
Vertical	Z	Y

6.5 Results

Summary of the test results : Pass

Test data : APPENDIX 2 Page 22 - 24 (30 - 1000MHz)
: APPENDIX 2 Page 25 - 30 (1 - 26GHz)

Date: July 1, 2005 Test engineer : Makoto Hosaka

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APPENDIX 1: Photographs of test setup

Page 13	:	Conducted emission
Page 14	:	Radiated emission
Page 15 - 16	:	Pre check of worse-case position

APPENDIX 2: Test Data

Page 17 - 21	:	Conducted Emission
Page 22 - 30	:	Out of Band Emissions (Radiated)
22 - 24	:	30-1000MHz
25 - 30	:	1-26GHz

APPENDIX 3: Test instruments

Page 31	:	Test instruments
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Conducted emission (Antenna: HFS05-SO02NN)



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Radiated emission (Antenna: HFS05-SO02NN)



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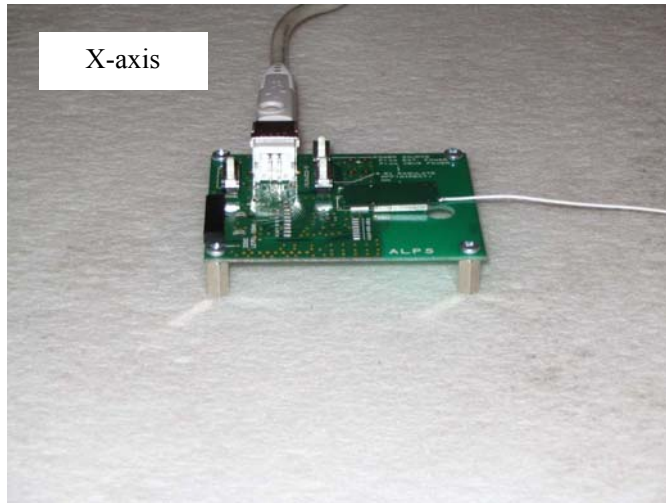
Telephone: +81 465 77 1011

Facsimile: +81 465 77 2112

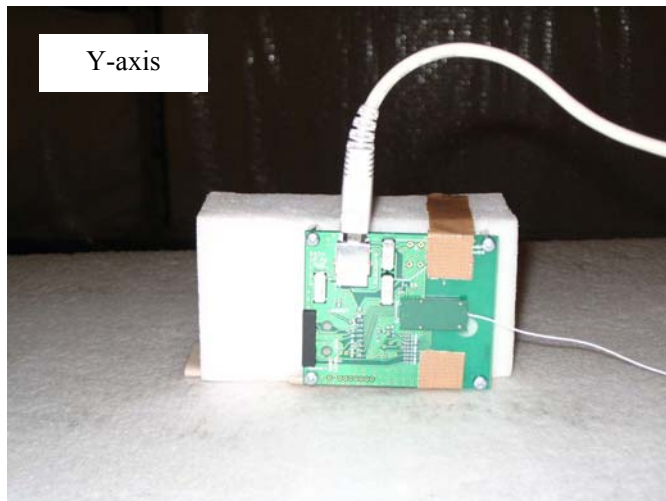
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Pre check of worse-case position (EUT)

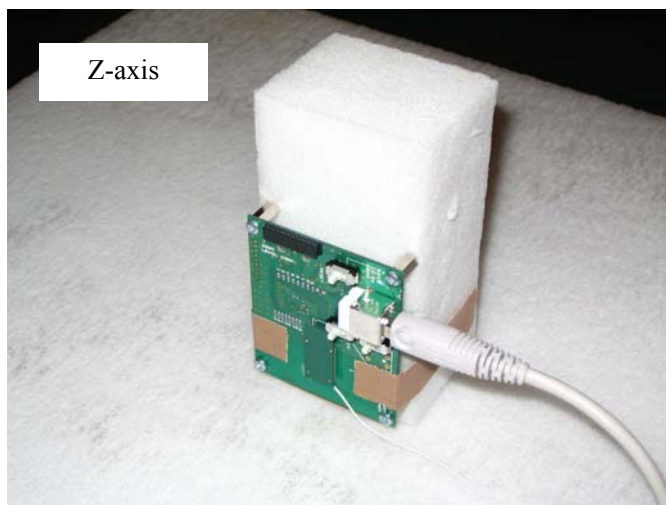
X-axis



Y-axis



Z-axis



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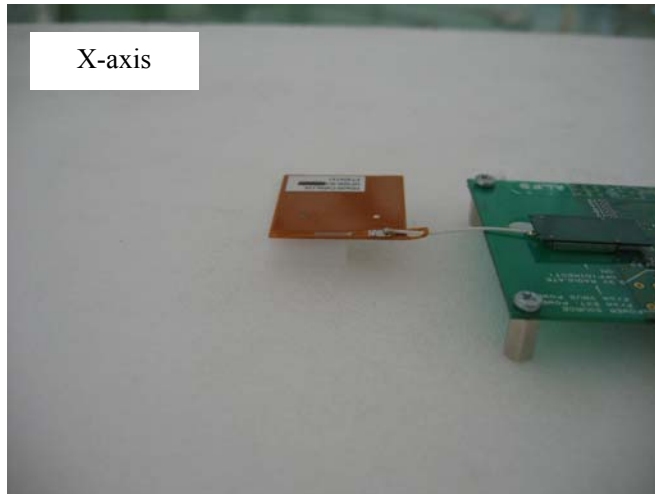
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Facsimile: +81 465 77 2112

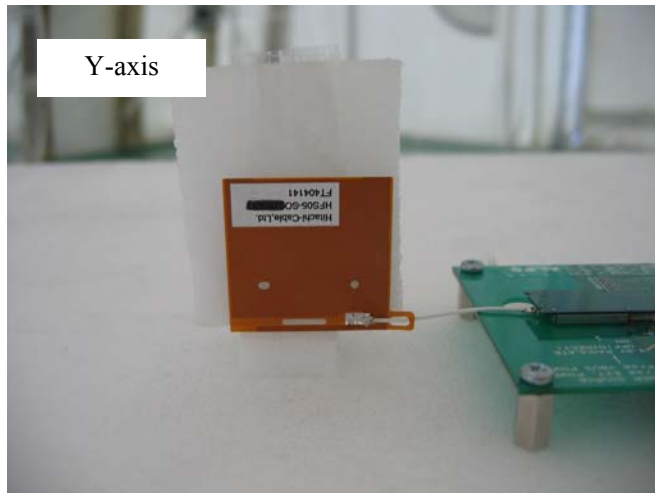
MF060b(01.06.05)

Pre check of worse-case position (Antenna: HFS05-SO02NN)

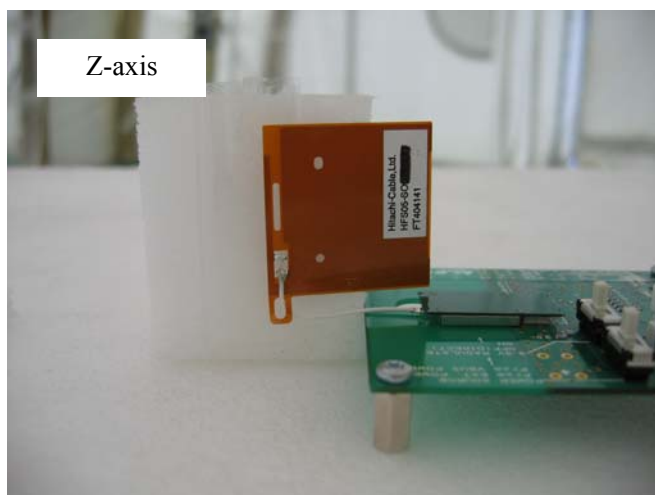
X-axis



Y-axis



Z-axis



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MF060b(01.06.05)

DATA OF CONDUCTION TEST

UL Apex Co.,Ltd.
YAMAKITA No.1 SHIELD TEST ROOM
Report No. : 25KE0251-YK **51**

Applicant : Alps Electric Co.,Ltd.
Kind of Equipment : Bluetooth Transceiver Module
Model No. : UGPZ6
Serial No. : 1
Power : DC3. 3V (AC120V/60Hz)
Mode : Transmitting (2402MHz)
Remarks : antenna type: HFS05-S002NN
Date : 7/1/2005
Phase : Single Phase
Temperature : 23 °C Engineer : Makoto Hosaka
Humidity : 72 %
Regulation : FCC Part15C § 15. 207. (CISPR Pub. 22)

No.	FREQ. [MHz]	READING (N)		READING (L1)		LISN FACTOR [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS		MARGIN	
		QP [dB μ V]	AV	QP [dB μ V]	AV				QP [dB]	AV [dB μ V]	QP [dB μ V]	AV [dB μ V]	QP [dB]	AV [dB]
1.	0. 1500	33. 3	-	33. 3	-	0. 1	0. 1	0. 0	33. 5	-	66. 0	56. 0	32. 5	-
2.	0. 1816	42. 1	-	42. 9	-	0. 1	0. 1	0. 0	43. 1	-	64. 4	54. 4	21. 3	-
3.	0. 2425	38. 9	-	40. 6	-	0. 1	0. 1	0. 0	40. 8	-	62. 0	52. 0	21. 2	-
4.	0. 3628	27. 5	-	29. 9	-	0. 1	0. 1	0. 0	30. 1	-	58. 7	48. 7	28. 6	-
5.	0. 5442	20. 6	-	27. 2	-	0. 0	0. 2	0. 0	27. 4	-	56. 0	46. 0	28. 6	-
6.	2. 9660	14. 1	-	17. 8	-	0. 2	0. 4	0. 0	18. 4	-	56. 0	46. 0	37. 6	-

CALCULATION: READING + LISN FACTOR + CABLE LOSS + ATTEN.

■ LISN :KLS-01 (NSLK8126) ■ COAXIAL CABLE:KCC-14/15/16/18
■ PULSE LIMITTER:KPL-01 (PL01) ■ EMI RECEIVER:KTR-02 (ESCS30)

DATA OF CONDUCTION TEST

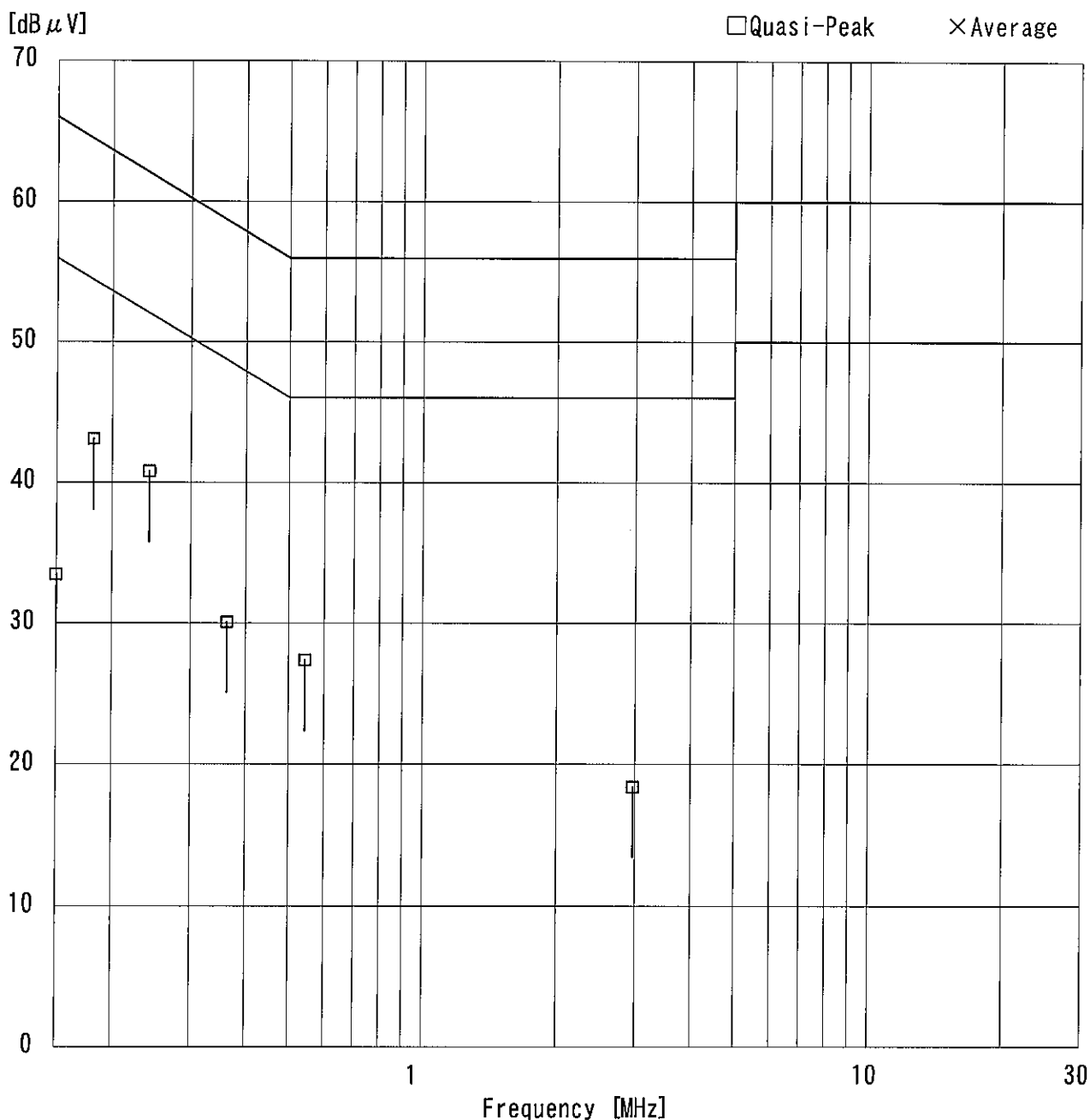
UL Apex Co.,Ltd.

YAMAKITA No.1 SHIELD TEST ROOM

Report No. : 25KE0251-YK **1**

Applicant : Alps Electric Co.,Ltd.
Kind of Equipment : Bluetooth Transceiver Module
Model No. : UGPZ6
Serial No. : 1
Power : DC3.3V (AC120V/60Hz)
Mode : Transmitting (2402MHz)
Remarks : antenna type: HFS05-S002NN
Date : 7/1/2005
Phase : Single Phase
Temperature : 23 °C
Humidity : 72 %
Regulation : FCC Part15C § 15.207. (CISPR Pub. 22)

Engineer : Makoto Hosaka



DATA OF CONDUCTION TEST CHART

UL Apex Co.,Ltd.

YAMAKITA No.1 SHIELD TEST ROOM

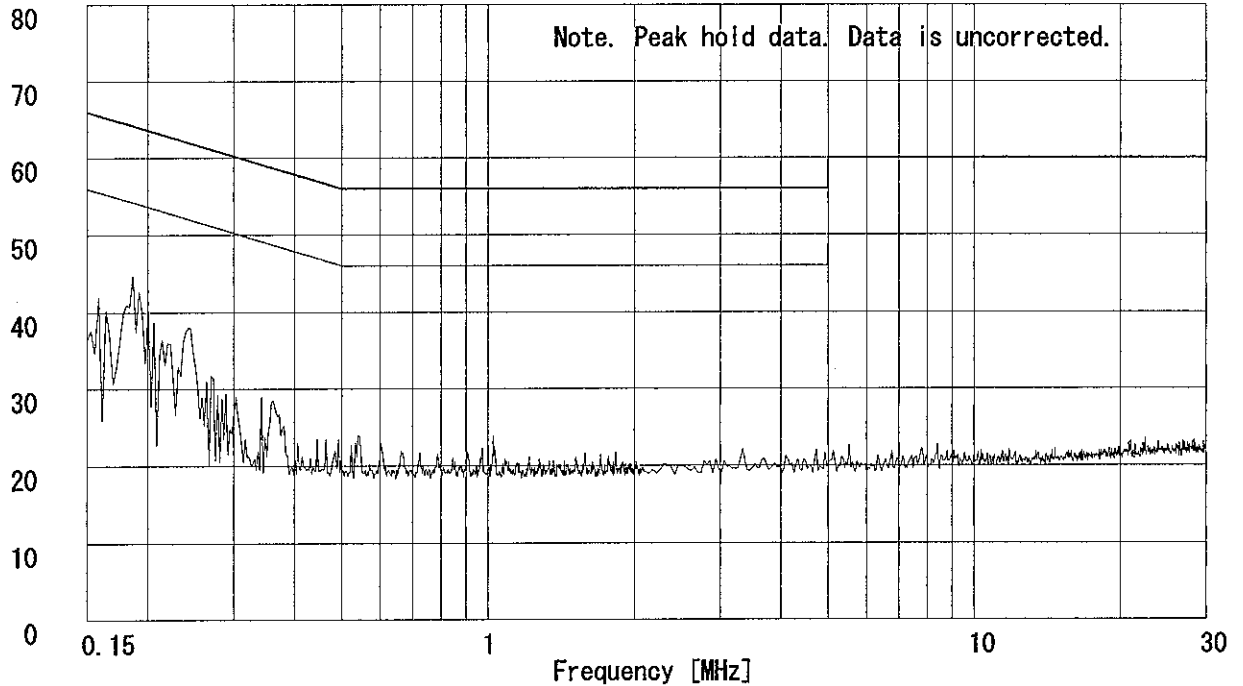
Report No. : 25KE0251-YK 

Applicant : Alps Electric Co.,Ltd.
Kind of Equipment : Bluetooth Transceiver Module
Model No. : UGPZ6
Serial No. : 1
Power : DC3.3V(AC120V/60Hz)
Mode : Transmitting(2402MHz)
Remarks : antenna type: HFS05-S002NN
Date : 7/1/2005
Phase : Single Phase
Temperature : 23 °C
Humidity : 72 %
Regulation 1 : FCC Part15C § 15.207. (CISPR Pub.22)
Regulation 2 : None

Engineer : Makoto Hosaka

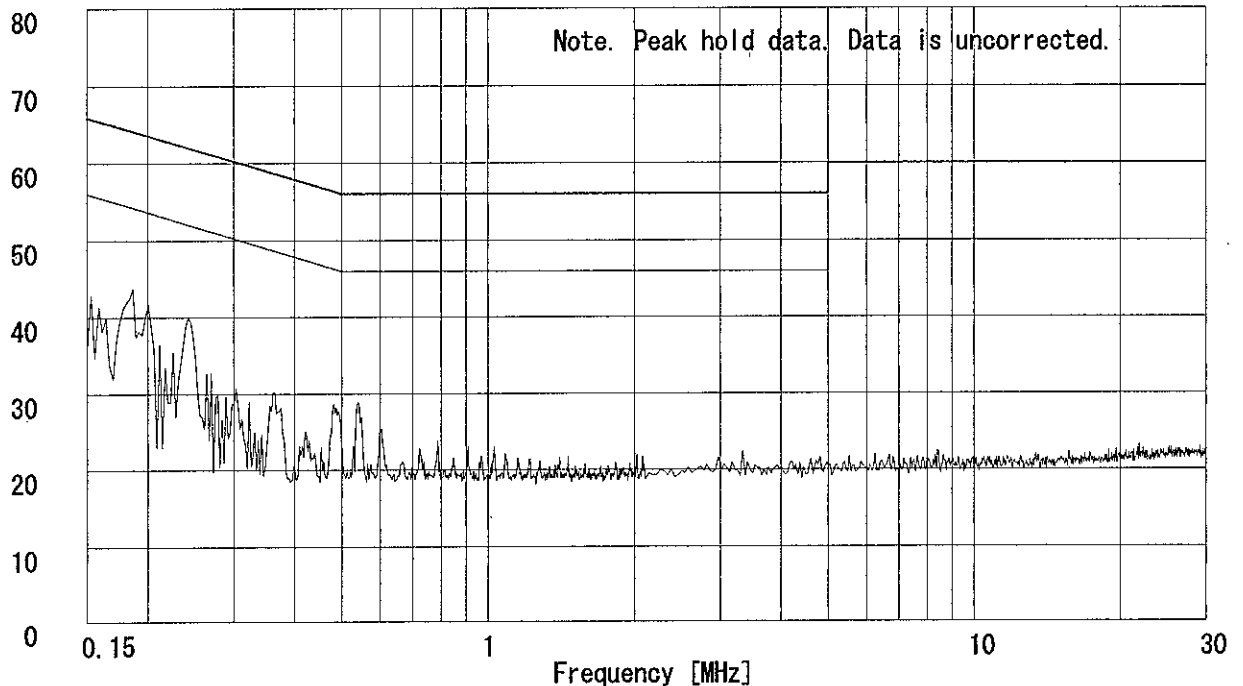
Emission Level [dB μ V]

PHASE:N



Emission Level [dB μ V]

PHASE:L1



DATA OF CONDUCTION TEST CHART

UL Apex Co.,Ltd.

YAMAKITA No.1 SHIELD TEST ROOM

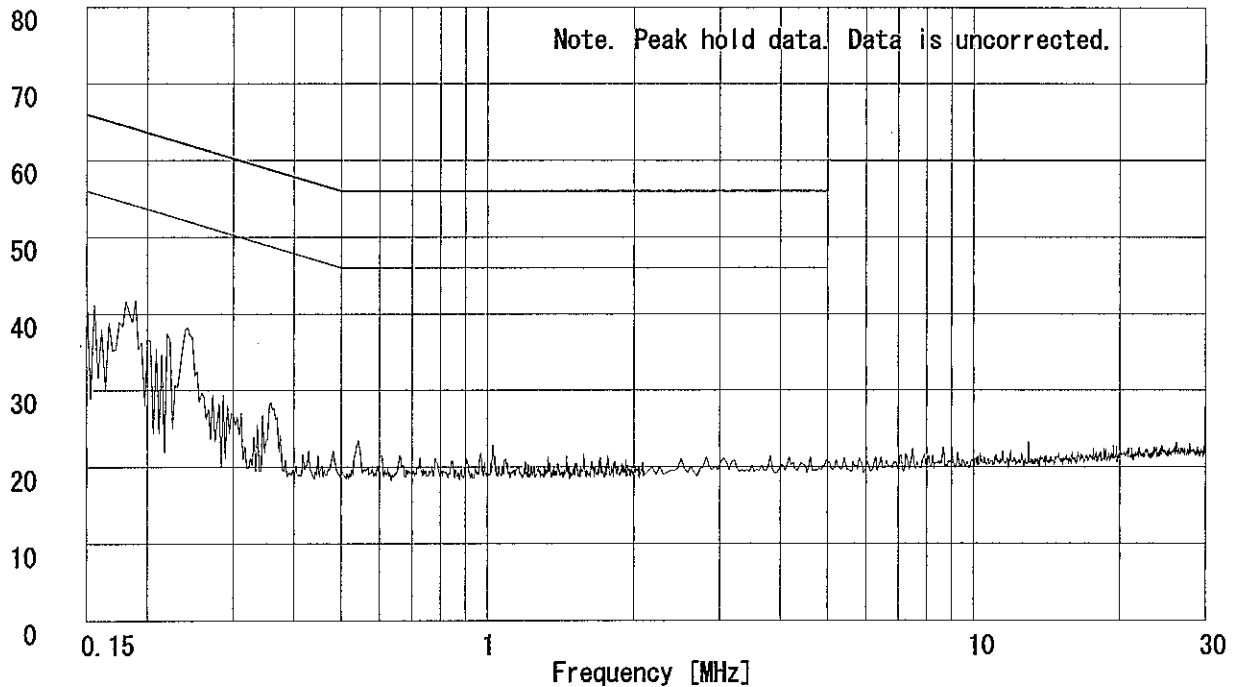
Report No. : 25KE0251-YK **1**

Applicant : Alps Electric Co.,Ltd.
Kind of Equipment : Bluetooth Transceiver Module
Model No. : UGPZ6
Serial No. : 1
Power : DC3.3V(AC120V/60Hz)
Mode : Transmitting(2441MHz)
Remarks : antenna type: HFS05-S002NN
Date : 7/1/2005
Phase : Single Phase
Temperature : 23 °C
Humidity : 72 %
Regulation 1 : FCC Part15C § 15.207. (CISPR Pub.22)
Regulation 2 : None

Engineer : Makoto Hosaka

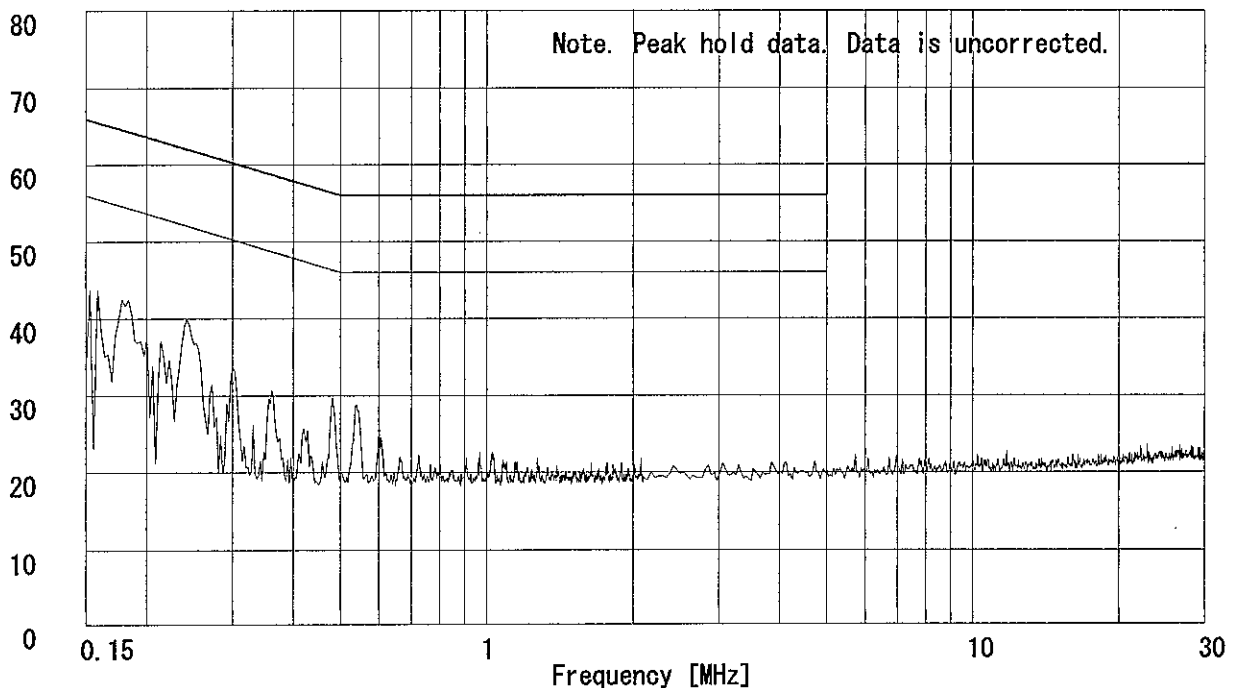
Emission Level [dB μ V]

PHASE:N



Emission Level [dB μ V]


PHASE:L1



DATA OF CONDUCTION TEST CHART

UL Apex Co.,Ltd.

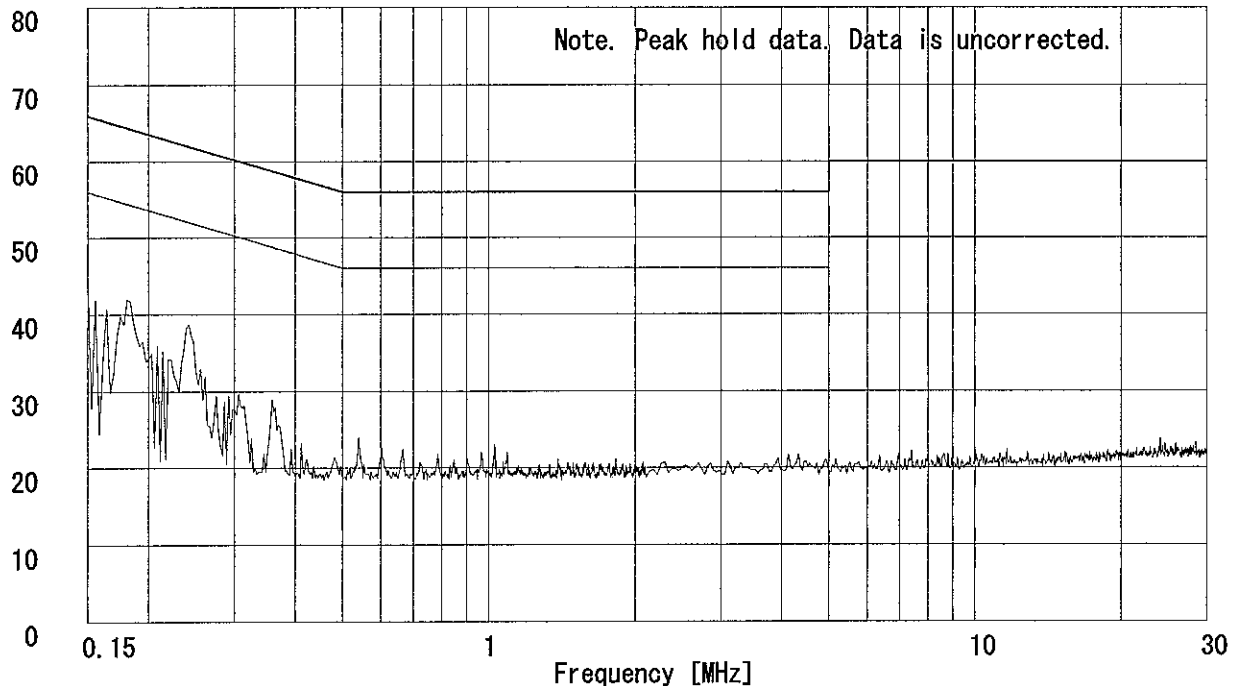
YAMAKITA No.1 SHIELD TEST ROOM

Report No. : 25KE0251-YK 

Applicant : Alps Electric Co.,Ltd.
Kind of Equipment : Bluetooth Transceiver Module
Model No. : UGPZ6
Serial No. : 1
Power : DC3.3V(AC120V/60Hz)
Mode : Transmitting(2480MHz)
Remarks : antenna type: HFS05-S002NN
Date : 7/1/2005
Phase : Single Phase
Temperature : 23 °C Engineer : Makoto Hosaka
Humidity : 72 %
Regulation 1 : FCC Part15C § 15.207. (CISPR Pub.22)
Regulation 2 : None

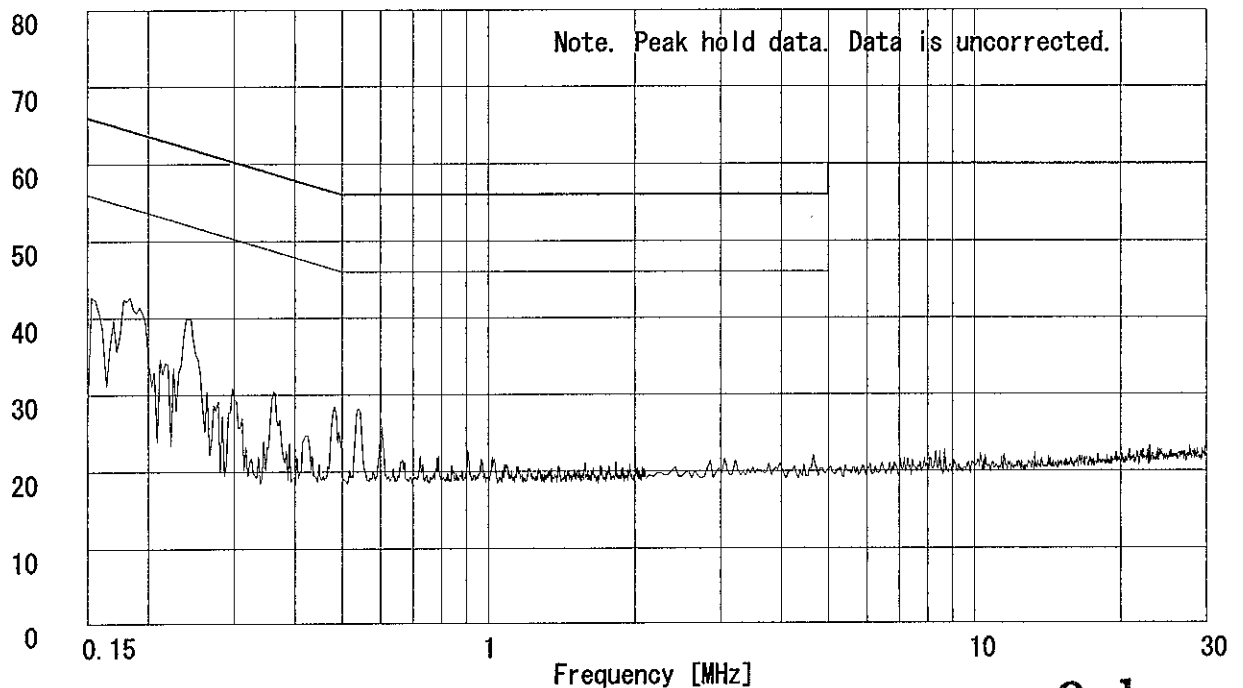
Emission Level [dB μ V]

PHASE:N



Emission Level [dB μ V]

PHASE:L1



DATA OF RADIATION TEST

UL Apex Co.,Ltd.

Yamakita No.1 Open Test Site

Report No. : 25KE0251-YK S 11

Applicant : Alps Electric Co.,Ltd.
Kind of Equipment : Bluetooth Transceiver Module
Model No. : UGPZ6
Serial No. : 1
Power : DC3.3V (AC120V/60Hz)
Mode : Transmitting (2402MHz)
Remarks : antenna type: HFS05-S002NN
Date : 7/1/2005
Test Distance : 3 m
Temperature : 24 °C
Humidity : 73 %
Regulation : FCC Part15C § 15.209

Engineer : Makoto Hosaka

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB μ V/m]	MARGIN	
			HOR [dB μ V]	VER [dB μ V]					HOR [dB μ V/m]	VER [dB μ V/m]		HOR [dB]	VER [dB]
1.	66.65	BB	31.4	46.6	6.7	28.4	2.1	6.0	17.8	33.0	40.0	22.2	7.0
2.	96.35	BB	39.2	43.0	9.5	28.3	2.5	6.0	28.9	32.7	43.5	14.6	10.8
3.	192.72	BB	32.2	38.5	16.5	27.9	3.7	6.0	30.5	36.8	43.5	13.0	6.7
4.	199.95	BB	34.3	39.2	16.5	27.9	3.8	6.0	32.7	37.6	43.5	10.8	5.9
5.	266.60	BB	33.6	41.1	18.0	27.7	4.4	6.0	34.3	41.8	46.0	11.7	4.2
6.	299.91	BB	30.7	34.1	19.9	27.7	4.8	6.0	33.7	37.1	46.0	12.3	8.9
7.	333.24	BB	33.0	40.9	15.3	27.9	5.1	6.0	31.5	39.4	46.0	14.5	6.6
8.	399.90	BB	34.1	41.6	17.4	28.5	5.7	6.0	34.7	42.2	46.0	11.3	3.8
9.	933.09	BB	23.3	29.0	23.6	28.6	9.3	6.0	33.6	39.3	46.0	12.4	6.7

CALCULATION: READING + ANT. FACTOR + CABLE LOSS - AMP. GAIN + ATTEN.



■ ANTENNA: KBA-01 (BBA9106) 30-299.99MHz/KLA-01 (USLP9143) 300-1000MHz

■ CABLE: KCC-10/11/12/13/18 ■ PREAMP: KAF-01 (8447D) ■ EMI RECEIVER: KTR-02 (ESCS30)

DATA OF RADIATION TEST

UL Apex Co.,Ltd.

Yamakita No.1 Open Test Site

Report No. : 25KE0251-YK  

Applicant : Alps Electric Co.,Ltd.
Kind of Equipment : Bluetooth Transceiver Module
Model No. : UGPZ6
Serial No. : 1
Power : DC3.3V (AC120V/60Hz)
Mode : Transmitting (2441MHz)
Remarks : antenna type: HFS05-S002NN
Date : 7/1/2005
Test Distance : 3 m
Temperature : 24 °C
Humidity : 73 %
Regulation : FCC Part15C § 15.209

Engineer : Makoto Hosaka

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB μV/m]	MARGIN	
			HOR [dB μV]	VER [dB μV]					HOR [dB μV/m]	VER [dB μV/m]		HOR [dB]	VER [dB]
1.	66.66	BB	34.9	49.8	6.7	28.4	2.1	6.0	21.3	36.2	40.0	18.7	3.8
2.	96.37	BB	40.0	46.3	9.5	28.3	2.5	6.0	29.7	36.0	43.5	13.8	7.5
3.	192.72	BB	31.5	30.4	16.5	27.9	3.7	6.0	29.8	28.7	43.5	13.7	14.8
4.	199.95	BB	33.3	37.5	16.5	27.9	3.8	6.0	31.7	35.9	43.5	11.8	7.6
5.	266.60	BB	32.8	39.0	18.0	27.7	4.4	6.0	33.5	39.7	46.0	12.5	6.3
6.	299.91	BB	30.0	35.4	19.9	27.7	4.8	6.0	33.0	38.4	46.0	13.0	7.6
7.	333.24	BB	35.9	38.0	15.3	27.9	5.1	6.0	34.4	36.5	46.0	11.6	9.5
8.	399.89	BB	28.6	40.6	17.4	28.5	5.7	6.0	29.2	41.2	46.0	16.8	4.8
9.	933.08	BB	23.7	29.5	23.6	28.6	9.3	6.0	34.0	39.8	46.0	12.0	6.2

CALCULATION: READING + ANT. FACTOR + CABLE LOSS - AMP. GAIN + ATTEN.

■ ANTENNA: KBA-01 (BBA9106) 30-299.99MHz/KLA-01 (USLP9143) 300-1000MHz
■ CABLE: KCC-10/11/12/13/18 ■ PREAMP: KAF-01 (8447D) ■ EMI RECEIVER: KTR-02 (ESCS30)

DATA OF RADIATION TEST

UL Apex Co.,Ltd.

Yamakita No.1 Open Test Site

Report No. : 25KE0251-YK **51**

Applicant : Alps Electric Co.,Ltd.
 Kind of Equipment : Bluetooth Transceiver Module
 Model No. : UGPZ6
 Serial No. : 1
 Power : DC3.3V (AC120V/60Hz)
 Mode : Transmitting (2480MHz)
 Remarks : antenna type: HFS05-S002NN
 Date : 7/1/2005
 Test Distance : 3 m
 Temperature : 24 °C
 Humidity : 73 %
 Regulation : FCC Part15C § 15.209

Engineer : Makoto Hosaka

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB μV/m]	MARGIN	
			HOR [dB μV]	VER [dB μV]					HOR [dB μV/m]	VER [dB μV/m]		HOR [dB]	VER [dB]
1.	66.66	BB	38.8	48.6	6.7	28.4	2.1	6.0	25.2	35.0	40.0	14.8	5.0
2.	96.35	BB	38.7	42.4	9.5	28.3	2.5	6.0	28.4	32.1	43.5	15.1	11.4
3.	192.72	BB	31.1	35.0	16.5	27.9	3.7	6.0	29.4	33.3	43.5	14.1	10.2
4.	199.95	BB	35.1	39.3	16.5	27.9	3.8	6.0	33.5	37.7	43.5	10.0	5.8
5.	266.62	BB	32.3	38.9	18.0	27.7	4.4	6.0	33.0	39.6	46.0	13.0	6.4
6.	299.93	BB	32.0	35.4	19.9	27.7	4.8	6.0	35.0	38.4	46.0	11.0	7.6
7.	333.26	BB	37.0	39.1	15.3	27.9	5.1	6.0	35.5	37.6	46.0	10.5	8.4
8.	399.90	BB	31.9	41.1	17.4	28.5	5.7	6.0	32.5	41.7	46.0	13.5	4.3
9.	933.08	BB	23.8	28.8	23.6	28.6	9.3	6.0	34.1	39.1	46.0	11.9	6.9


CALCULATION: READING + ANT. FACTOR + CABLE LOSS - AMP. GAIN + ATTEN.

■ ANTENNA: KBA-01 (BBA9106) 30-299.99MHz/KLA-01 (USLP9143) 300-1000MHz
 ■ CABLE: KCC-10/11/12/13/18 ■ PREAMP: KAF-01 (8447D) ■ EMI RECEIVER: KTR-02 (ESCS30)

DATA OF RADIATION TEST

UL Apex Co.,Ltd.

Yamakita No.1 Open Test Site

Report No. : 25KE0251-YK  1

Applicant : Alps Electric Co.,Ltd.
Kind of Equipment : Bluetooth Transceiver Module
Model No. : UGPZ6
Serial No. : 1
Power : DC3. 3V (AC120V/60Hz)
Mode : Transmitting (2402MHz)
Remarks : antenna type: HFS05-S002NN PK (RBW:1MHz, VBW:1MHz)
Date : 7/1/2005
Test Distance : 3 m
Temperature : 24 °C Engineer : Makoto Hosaka
Humidity : 73 %
Regulation : FCC Part15C § 15. 209 (PK Detection)

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB μ V/m]	MARGIN	
			HOR [dB μ V]	VER [dB μ V]					HOR [dB μ V/m]	VER [dB μ V/m]		HOR [dB]	VER [dB]
1.	2390.00	BB	42.4	43.7	31.5	37.0	4.0	10.0	50.9	52.2	74.0	23.1	21.8
2.	4804.00	BB	56.5	51.2	35.3	36.5	5.5	0.5	61.3	56.0	74.0	12.7	18.0
3.	7206.00	BB	43.0	41.7	37.8	36.8	6.6	0.2	50.8	49.5	74.0	23.2	24.5
4.	9608.00	BB	40.4	38.4	39.0	37.1	7.4	0.5	50.2	48.2	74.0	23.8	25.8
5.	12010.00	BB	40.3	38.5	43.1	36.2	8.2	0.0	55.4	53.6	74.0	18.6	20.4
6.	14412.00	BB	40.5	41.3	41.3	35.0	8.9	0.3	56.0	56.8	74.0	18.0	17.2
7.	16814.00	BB	42.2	41.5	42.5	35.7	9.6	0.6	59.2	58.5	74.0	14.8	15.5
8.	19216.00	BB	42.1	42.8	38.4	34.7	10.2	0.0	56.0	56.7	74.0	18.0	17.3
9.	21618.00	BB	42.6	42.9	38.8	35.7	10.6	0.0	56.3	56.6	74.0	17.7	17.4
10.	24020.00	BB	44.1	44.5	39.1	34.9	11.0	0.0	59.3	59.7	74.0	14.7	14.3

CALCULATION: READING + ANT. FACTOR + CABLE LOSS - AMP. GAIN + ATTEN.


■ ANTENNA: KHA-01 (SAS-200 571) 1-18GHz/KHA-03 (3160-09) 18-26GHz

■ CABLE: KCC-D3/D7 ■ PREAMP: KAF-02 (8449B) ■ SPECTRUMANALYZER: R3271A (KSA-04)

DATA OF RADIATION TEST

UL Apex Co.,Ltd.

Yamakita No.1 Open Test Site

Report No. : 25KE0251-YK 

Applicant : Alps Electric Co.,Ltd.
Kind of Equipment : Bluetooth Transceiver Module
Model No. : UGPZ6
Serial No. : 1
Power : DC3.3V (AC120V/60Hz)
Mode : Transmitting (2402MHz)
Remarks : antenna type: HFS05-S002NN AV (RBW:1MHz, VBW:10Hz)
Date : 7/1/2005
Test Distance : 3 m
Temperature : 24 °C Engineer : Makoto Hosaka
Humidity : 73 %
Regulation : FCC Part15C § 15.209 (AV Detection)

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB μ V/m]	MARGIN	
			HOR [dB μ V]	VER [dB μ V]					HOR [dB μ V/m]	VER [dB μ V/m]		HOR [dB]	VER [dB]
1.	2390.00	BB	31.7	33.1	31.5	37.0	4.0	10.0	40.2	41.6	54.0	13.8	12.4
2.	4804.00	BB	42.3	38.5	35.3	36.5	5.5	0.5	47.1	43.3	54.0	6.9	10.7
3.	7206.00	BB	30.9	31.1	37.8	36.8	6.6	0.2	38.7	38.9	54.0	15.3	15.1
4.	9608.00	BB	30.3	28.8	39.0	37.1	7.4	0.5	40.1	38.6	54.0	13.9	15.4
5.	12010.00	BB	30.6	28.6	43.1	36.2	8.2	0.0	45.7	43.7	54.0	8.3	10.3
6.	14412.00	BB	30.5	30.4	41.3	35.0	8.9	0.3	46.0	45.9	54.0	8.0	8.1
7.	16814.00	BB	31.3	30.9	42.5	35.7	9.6	0.6	48.3	47.9	54.0	5.7	6.1
8.	19216.00	BB	32.0	32.1	38.4	34.7	10.2	0.0	45.9	46.0	54.0	8.1	8.0
9.	21618.00	BB	33.0	32.9	38.8	35.7	10.6	0.0	46.7	46.6	54.0	7.3	7.4
10.	24020.00	BB	32.8	33.1	39.1	34.9	11.0	0.0	48.0	48.3	54.0	6.0	5.7

CALCULATION: READING + ANT.FACTOR + CABLE LOSS - AMP.GAIN + ATTEN.


■ ANTENNA: KHA-01 (SAS-200 571) 1-18GHz/KHA-03 (3160-09) 18-26GHz

■ CABLE: KCC-D3/D7 ■ PREAMP: KAF-02 (8449B) ■ SPECTRUMANALYZER: R3271A (KSA-04)

DATA OF RADIATION TEST

UL Apex Co.,Ltd.

Yamakita No.1 Open Test Site

Report No. : 25KE0251-YK 

Applicant : Alps Electric Co.,Ltd.
Kind of Equipment : Bluetooth Transceiver Module
Model No. : UGPZ6
Serial No. : 1
Power : DC3.3V (AC120V/60Hz)
Mode : Transmitting (2441MHz)
Remarks : antenna type: HFS05-S002NN PK (RBW:1MHz, VBW:1MHz)
Date : 7/1/2005
Test Distance : 3 m
Temperature : 24 °C Engineer : Makoto Hosaka
Humidity : 73 %
Regulation : FCC Part15C § 15.209 (PK Detection)

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB μV/m]	MARGIN	
			HOR [dB μV]	VER [dB μV]					HOR [dB μV/m]	VER [dB μV/m]		HOR [dB]	VER [dB]
1.	4882.00	BB	59.1	56.3	35.8	36.5	5.5	0.5	64.4	61.6	74.0	9.6	12.4
2.	7323.00	BB	40.7	41.5	38.0	36.8	6.7	0.2	48.8	49.6	74.0	25.2	24.4
3.	9764.00	BB	41.5	40.1	39.0	37.1	7.4	0.3	51.1	49.7	74.0	22.9	24.3
4.	12205.00	BB	41.2	40.5	43.4	36.0	8.1	0.0	56.7	56.0	74.0	17.3	18.0
5.	14646.00	BB	42.3	41.8	42.4	35.3	8.9	0.5	58.8	58.3	74.0	15.2	15.7
6.	17087.00	BB	41.6	40.6	42.6	35.6	9.7	0.5	58.8	57.8	74.0	15.2	16.2
7.	19528.00	BB	42.1	42.6	37.9	35.2	10.5	0.0	55.3	55.8	74.0	18.7	18.2
8.	21969.00	BB	44.1	43.7	38.8	35.1	10.9	0.0	58.7	58.3	74.0	15.3	15.7
9.	24410.00	BB	44.2	43.6	39.2	35.0	11.1	0.0	59.5	58.9	74.0	14.5	15.1

CALCULATION: READING + ANT.FACTOR + CABLE LOSS - AMP.GAIN + ATTEN.


■ANTENNA:KHA-01 (SAS-200 571) 1-18GHz/KHA-03 (3160-09) 18-26GHz

■CABLE:KCC-D3/D7 ■PREAMP:KAF-02 (8449B) ■SPECTRUMANALYZER: R3271A (KSA-04)

DATA OF RADIATION TEST

UL Apex Co.,Ltd.

Yamakita No.1 Open Test Site

Report No. : 25KE0251-YK 

Applicant : Alps Electric Co.,Ltd.
 Kind of Equipment : Bluetooth Transceiver Module
 Model No. : UGPZ6
 Serial No. : 1
 Power : DC3.3V (AC120V/60Hz)
 Mode : Transmitting (2441MHz)
 Remarks : antenna type: HFS05-S002NN AV (RBW:1MHz, VBW:10Hz)
 Date : 7/1/2005
 Test Distance : 3 m
 Temperature : 24 °C Engineer : Makoto Hosaka
 Humidity : 73 %
 Regulation : FCC Part15C § 15.209 (AV Detection)

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB μV/m]	MARGIN	
			HOR [dB μV]	VER [dB μV]					HOR [dB μV/m]	VER [dB μV/m]		HOR [dB]	VER [dB]
1.	4882.00	BB	43.9	42.9	35.8	36.5	5.5	0.5	49.2	48.2	54.0	4.8	5.8
2.	7323.00	BB	30.3	30.6	38.0	36.8	6.7	0.2	38.4	38.7	54.0	15.6	15.3
3.	9764.00	BB	31.3	29.9	39.0	37.1	7.4	0.3	40.9	39.5	54.0	13.1	14.5
4.	12205.00	BB	30.8	30.0	43.4	36.0	8.1	0.0	46.3	45.5	54.0	7.7	8.5
5.	14646.00	BB	31.0	30.7	42.4	35.3	8.9	0.5	47.5	47.2	54.0	6.5	6.8
6.	17087.00	BB	30.8	30.5	42.6	35.6	9.7	0.5	48.0	47.7	54.0	6.0	6.3
7.	19528.00	BB	31.5	32.0	37.9	35.2	10.5	0.0	44.7	45.2	54.0	9.3	8.8
8.	21969.00	BB	33.7	34.0	38.8	35.1	10.9	0.0	48.3	48.6	54.0	5.7	5.4
9.	24410.00	BB	32.8	33.3	39.2	35.0	11.1	0.0	48.1	48.6	54.0	5.9	5.4

CALCULATION: READING + ANT. FACTOR + CABLE LOSS - AMP. GAIN + ATTEN.


■ANTENNA:KHA-01 (SAS-200 571) 1-18GHz/KHA-03 (3160-09) 18-26GHz

■CABLE:KCC-D3/D7 ■PREAMP:KAF-02 (8449B) ■SPECTRUMANALYZER: R3271A (KSA-04)

DATA OF RADIATION TEST

UL Apex Co.,Ltd.

Yamakita No.1 Open Test Site

Report No. : 25KE0251-YK 

Applicant : Alps Electric Co.,Ltd.
Kind of Equipment : Bluetooth Transceiver Module
Model No. : UGPZ6
Serial No. : 1
Power : DC3. 3V (AC120V/60Hz)
Mode : Transmitting (2480MHz)
Remarks : antenna type: HFS05-S002NN PK (RBW:1MHz, VBW:1MHz)
Date : 7/1/2005
Test Distance : 3 m
Temperature : 24 °C Engineer : Makoto Hosaka
Humidity : 73 %
Regulation : FCC Part15C § 15. 209 (PK Detection)

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB μ V/m]	MARGIN	
			HOR [dB μ V]	VER [dB μ V]					HOR [dB μ V/m]	VER [dB μ V/m]		HOR [dB]	VER [dB]
1.	2483.50	BB	46.0	49.0	32.0	37.1	4.0	10.0	54.9	57.9	74.0	19.1	16.1
2.	4960.00	BB	60.2	57.5	36.2	36.4	5.6	0.5	66.1	63.4	74.0	7.9	10.6
3.	7440.00	BB	40.6	41.1	38.3	36.8	6.7	0.2	49.0	49.5	74.0	25.0	24.5
4.	9920.00	BB	41.7	40.8	39.0	37.0	7.4	0.2	51.3	50.4	74.0	22.7	23.6
5.	12400.00	BB	40.9	39.9	43.7	35.7	8.1	0.0	57.0	56.0	74.0	17.0	18.0
6.	14880.00	BB	41.3	45.8	43.7	35.7	9.0	0.7	59.0	63.5	74.0	15.0	10.5
7.	17360.00	BB	41.8	41.0	43.0	35.7	9.5	0.2	58.8	58.0	74.0	15.2	16.0
8.	19840.00	BB	44.8	44.0	38.2	35.0	10.5	0.0	58.5	57.7	74.0	15.5	16.3
9.	22320.00	BB	43.9	43.7	39.1	35.0	11.0	0.0	59.0	58.8	74.0	15.0	15.2
10.	24800.00	BB	44.9	46.2	39.4	34.7	11.5	0.0	61.1	62.4	74.0	12.9	11.6

CALCULATION: READING + ANT. FACTOR + CABLE LOSS - AMP. GAIN + ATTEN.


■ ANTENNA: KHA-01 (SAS-200 571) 1-18GHz/KHA-03 (3160-09) 18-26GHz

■ CABLE: KCC-D3/D7 ■ PREAMP: KAF-02 (8449B) ■ SPECTRUMANALYZER: R3271A (KSA-04)

DATA OF RADIATION TEST

UL Apex Co.,Ltd.

Yamakita No.1 Open Test Site

Report No. : 25KE0251-YK 

Applicant : Alps Electric Co.,Ltd.
 Kind of Equipment : Bluetooth Transceiver Module
 Model No. : UGPZ6
 Serial No. : 1
 Power : DC3.3V (AC120V/60Hz)
 Mode : Transmitting (2480MHz)
 Remarks : antenna type: HFS05-S002NN AV (RBW:1MHz, VBW:10Hz)
 Date : 7/1/2005
 Test Distance : 3 m
 Temperature : 24 °C Engineer : Makoto Hosaka
 Humidity : 73 %
 Regulation : FCC Part15C § 15.209 (AV Detection)

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB μV/m]	MARGIN	
			HOR [dB μV]	VER [dB μV]					HOR [dB μV/m]	VER [dB μV/m]		HOR [dB]	VER [dB]
1.	2483.50	BB	37.3	38.8	32.0	37.1	4.0	10.0	46.2	47.7	54.0	7.8	6.3
2.	4960.00	BB	44.8	43.9	36.2	36.4	5.6	0.5	50.7	49.8	54.0	3.3	4.2
3.	7440.00	BB	30.3	30.7	38.3	36.8	6.7	0.2	38.7	39.1	54.0	15.3	14.9
4.	9920.00	BB	32.0	30.6	39.0	37.0	7.4	0.2	41.6	40.2	54.0	12.4	13.8
5.	12400.00	BB	30.4	29.5	43.7	35.7	8.1	0.0	46.5	45.6	54.0	7.5	8.4
6.	14880.00	BB	30.9	34.5	43.7	35.7	9.0	0.7	48.6	52.2	54.0	5.4	1.8
7.	17360.00	BB	31.4	31.6	43.0	35.7	9.5	0.2	48.4	48.6	54.0	5.6	5.4
8.	19840.00	BB	33.2	32.0	38.2	35.0	10.5	0.0	46.9	45.7	54.0	7.1	8.3
9.	22320.00	BB	33.7	33.3	39.1	35.0	11.0	0.0	48.8	48.4	54.0	5.2	5.6
10.	24800.00	BB	35.4	35.4	39.4	34.7	11.5	0.0	51.6	51.6	54.0	2.4	2.4

CALCULATION: READING + ANT. FACTOR + CABLE LOSS - AMP. GAIN + ATTEN.

■ANTENNA:KHA-01 (SAS-200 571) 1-18GHz/KHA-03 (3160-09) 18-26GHz

■CABLE:KCC-D3/D7 ■PREAMP:KAF-02 (8449B) ■SPECTRUMANALYZER: R3271A (KSA-04)

Test Report No :25KE0251-YK-1

APPENDIX 3

Test Instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No.	Test Item	Calibration Date * Interval (month)
KAF-01	Pre Amplifier	Hewlett Packard	8447D	RE	2005/05/24 * 12
KAF-02	Pre Amplifier	Hewlett Packard	8449B	RE	2005/04/28 * 12
KAT10-S1	Attenuator	Agilent	8449D 010	RE	2005/04/12 * 12
KAT6-01	Attenuator	INMET	18N-6dB	RE	2005/04/07 * 12
KBA-01	Biconical Antenna	Schwarzbeck	BBA9106	RE	2004/08/07 * 12
KCC-10/11/12 /13/18	Coaxial Cable	Fujikura/Suhner	8D-2W/12D-SFA/S0 4272B/S04272B/S04 272B	RE	2005/06/14 * 12
KCC-14/15/16 /18/KPL-01	Coaxial Cable/Pulse Limiter	Fujikura/Suhner/PMM	5D-2W/8D-2W/S042 72B/S04272B/PL01	CE	2005/06/14 * 12
KCC-D3/D7	Coaxial Cable	Rosenberger/Advantest	2201/JUN-08-01-06 1	RE	2005/04/12 * 12
KHA-01	Horn Antenna	A.H.Systems	SAS-200/571	RE	2004/07/30 * 12
KHA-03	Horn Antenna	EMCO	3160-09	RE	2005/05/14 * 12
KLA-01	Logperiodic Antenna	Schwarzbeck	USLP9143	RE	2005/01/29 * 12
KLS-01	LISN(AMN)	Schwarzbeck	NSLK8126	CE	2005/05/10 * 12
KOTS-01	Open Test Site	JSE	30m	RE	2004/08/14 * 12
KSA-04	Spectrum Analyzer	Advantest	R3271A	CE/RE	2004/09/15 * 12
KTR-02	Test Receiver	Rohde & Schwarz	ESCS30	CE/RE	2004/11/25 * 12
KFL-01	Highpass Filter	Hewlett Packard	84300 80038	RE	2005/04/12 * 12

All equipment is calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

Test Item:

CE: Conducted emission,
RE: Radiated emission